Site 353 Old County Road

Overview: The Old County Road potential restoration site is located on the southern side of Old County Road approximately 0.5 mi west of Salisbury Beach. The potential restoration site encompasses approximately 8 ac of degraded marsh and forested wetland upstream of several culverts under Old County Road. The road appears on the 1894 USGS Newburyport-Exeter, NH-MA Quadrangle map. The southern edge of the former wetland has been filled in the past and supports a defunct amusement park. There are several relatively low –lying residential properties on Old County Road to the east of the potential restoration site. The municipal sewer system was extended this year to accommodate these properties. Tidal exchange to the potential restoration site is conveyed through a series of culverts. One location includes a series of three culverts at various elevations. An additional culvert crosses under the road approximately 150 ft further west of this location. The small ditches which extend to the culverts are connected to Dead Creek which extends in a northerly direction to Blackwater River and ultimately Hampton-Seabrook Harbor. Old County Road is also relatively low-lying and is routinely overtopped during storm events. Tide gauge data collected by WRP in June of 2004 documented a maximum restriction of approximately 0.7 ft. Other evidence of a tidal restriction includes: impounded conditions upstream of the crossing, observed minor subsidence of the high marsh plain (approximately 0.25 feet) and extensive populations of *Phragmites.*

The potential restoration site is privately held and the current owner of most of the site is not opposed to restoration activities. The Old County Road right-of-way is municipally owned.

Structure conditions: There are a total of four culverts under Old County Road. Three culverts are located in a small ditch at the eastern end of the potential restoration site. Two of the culverts are 12 in CMP pipes and the other culvert is a 10 in CMP pipe. The downstream inverts have no scour protection or headwalls. The downstream invert of the eastern-most culvert (12 in CMP) is severely deteriorated. The upstream inverts of all three culverts are partially buried with sediment. Overall, these three structures are in fair condition. It is recommended that all three culverts be cleaned and inspected further. The fourth culvert is located in the middle of the potential restoration site approximately 150 ft west of the first three culverts. This culvert is a 12 in CMP pipe and is located in a small ditch. There is no scour protection or headwalls at either invert. Also, the downstream invert has become blocked by sediment and debris. Overall the culvert is in fair condition. All four culverts are between 38 and 44 ft in length.

County Farm Road is in poor condition. The pavement is severely cracked and has numerous potholes and is routinely overtopped by storms. The limited cover over the existing pipes somewhat restricts the size of replacement culverts without raising the height of the road.

Ecological Integrity: The potential restoration site generally has a low level of ecological integrity. None of the potential restoration site is currently held in conservation. The potential restoration site is contained within Supporting Natural Landscape to the Core Habitat associated with the Great Meadows salt marsh complex. The potential restoration site does not include Estimated Habitat for Rare Wildlife. Downstream of the potential restoration site, Dead Creek is mapped as suitable habitat for soft-shelled clam. Adjacent land uses are residential and commercial. The original salt marsh has been filled along the southern edge by past commercial activities. Approximately two-thirds of the remaining marsh is dominated by dense stands of *Phragmites* which will likely expand without control measures. The *Phragmites* growing adjacent to existing residential development along Old County Road represents a fire hazard.

The site has a long history of severe mosquito breeding problems and is sprayed by helicopter on a regular basis. Approximately 10 years ago, the Mosquito Control District developed plans to replace the series of three culverts with a single 36 in pipe combined with extensive ditch cutting/maintenance and OWMM work (W. Montgomery, Superintendent, NE MA MWMD). The restoration work was never completed. Existing ditching within the potential restoration site, as well as north of Old County Road, are not well maintained and result in limited tidal exchange and impounded conditions within the ditches and on portions of the marsh plain. Despite the observed poor drainage characteristics, the remaining areas of salt marsh within the restoration area primarily support *S. patens* and *Juncus*. Runoff from the adjacent development, as well as sediment and non-point source pollution sources may also be aiding in the spread of invasive species. No obvious signs of contamination were observed within the area of fill on the southern end of the site but testing would be required if any of the material was proposed for removal. The wetland also includes a red maple-dominated forested wetland to the west of the marsh. Impacts to the forested wetland are not anticipated as major subsidence was not observed within the wetland.

There is also a large stand of *Phragmites* downstream of the road crossing at the base of the adjacent closed landfill. This stand is likely supported by groundwater and possibly leachate flows from the landfill.

Two tide gauges were deployed from May 18 to July 8, 2005 upstream and downstream of the series of three culverts under Old County Road. Results of the gauge deployment show a limited restriction of tidal flow through the culvert that increases with the tidal prism increases. Tidal restrictions ranged from less than 0.1 to 0.17 ft and time delays ranged from less than 10 min to 23 min. The highest recorded tide downstream of the culvert occurred on June 23 at 4:56 AM at an adjusted height of 4.91 ft. Upstream high tide occurred at 5:09 AM at an adjusted height of 4.74 ft. The resulting tidal dampening was 0.17 ft. and a delay of 13 minutes. The dampening amounted to approximately 17.9% of the total tidal prism recorded at the downstream gauge. The only larger time delay was 23 min which occurred on June 24 during the morning tide. Relatively low salinities of 3.9 ppt downstream and 3.9 ppt upstream of the culvert were measured at the time of this gauge deployment.

Two tide gauges were previously deployed by WRP staff from May 26 to June 8, 2004 in similar locations. Results of this gauge deployment show a greater restriction of tidal flow through the culvert which increases as tidal prism increases. These restrictions occurred during all of the 24 tidal cycles recorded for this deployment. The highest recorded tide downstream of the culvert occurred on June 3 at 3:49 AM at a comparably adjusted height of 5.02 ft. Upstream high tide occurred at 4:10 AM at an adjusted height of 4.35 ft. The resulting tidal dampening was 0.67 ft and a delay of 21 minutes. The dampening amounted to 32.8% of the total tidal prism recorded at the downstream gauge. The differences in the amount of tidal restriction between the two deployments was likely related to differences in data logger locations. Both deployments show prolonged impounded conditions.

The overall severity of the existing impairments is considered severe. The replacement of the existing culvert with a somewhat larger structure set lower in the channel would reduce the small tidal restriction and the impounded conditions. Culvert replacement along with substantial ditch cutting/maintenance and OMWM work would be necessary to limit the expansion of the fringing populations of *Phragmites* and effectively control mosquito breeding. No substantial impact to the adjacent forested wetland is anticipated from the restoration activity. There are several low-lying residential properties along Old County Road. With one exception, all buildings are higher than the elevation of the existing road. It is reported that residences surrounding the site intend to

connect to municipal sewer, thus addressing past concerns of potential effects of increased tide elevations on surrounding septic systems (D. Levesque, DPW Director, pers. comm.).

Socioeconomic: Given the private land ownership, the overall recreational and educational values are limited. The potential restoration site's Uniqueness/Heritage value is enhanced by its proximity to the extensive marsh area mapped as BioMap Core Habitat. The potential restoration site does not include any known cultural resource elements or urban setting values. Alleviating the existing public heath concerns from the prolific mosquito breeding is an important social issue which increases the value of the restoration effort.

Construction Logistics/Feasibility: Constructability at this site is high. There are underground water and gas lines; but no overhead utilities within the project work area. Due to the low volume of traffic and the road's accessibility from two directions, it is assumed that Old County Road could be closed during construction. Restoration for this project would consist of replacing the existing crossing, which currently has a combination of three culverts, with a single larger structure. Effective restoration would also require substantial ditch cutting and maintenance and OMWM work. Given the limited existing tidal restriction, it may not be necessary to replace the culvert at the second crossing however; maintenance of the ditch draining to it would be beneficial. The total construction costs associated with this project are estimated to be $375,000. The project has a high level of support from the Town and the Mosquito Management District, as well as the general support of the primary land owner.

Restoration Potential: The site is considered to have moderate restoration potential which is increased by the public heath issues associated with known mosquito breeding, fire concerns associated with the stands of *Phragmites* adjacent to residential properties and a high level of local interest. Habitat and recreational values are reduced by the current state of degradation and lack of public access. Further efforts should focus on gaining support of land owners, including plans to redevelop the lands to the south, additional data to confirm status of sewer tie-ins, and confirmation of the minor utility concerns. Further coordination with the Mosquito Management District should also occur to identify partnering opportunities and to ensure coordination of multiple objectives into any restoration project, including mosquito control and marsh habitat restoration.

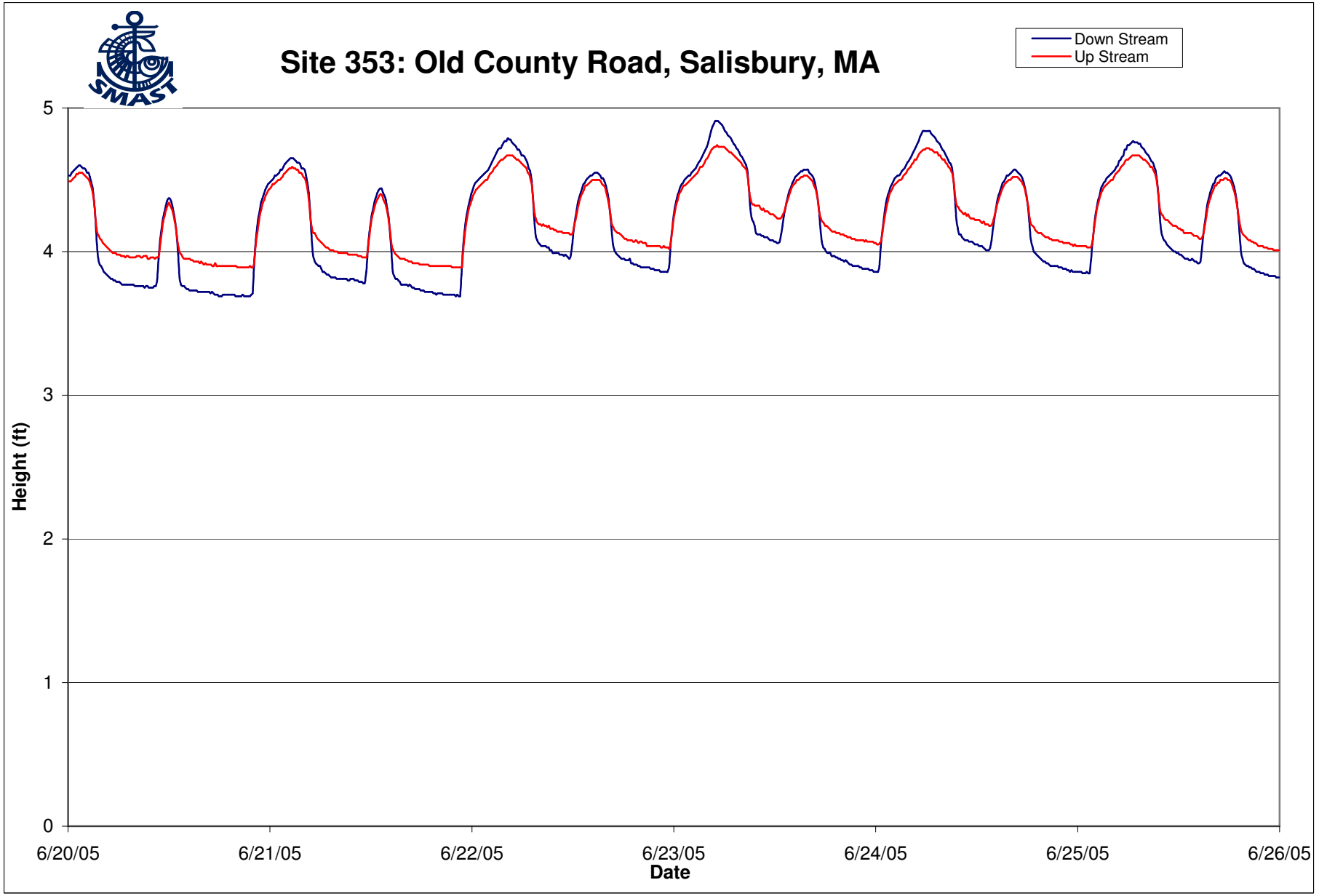
Site # 353 | Site Features | Scale: 1:1,500

Photo 1 - Central Portion of Site Viewing South

Photo 2 - Eastern End of Site Viewing South

Photo 3 - Downstream View of Eastern Culvert Crossing

Photo 4 - Salt Marsh Downstream of Road Crossing Viewing North


Site 353: Old County Road, Salisbury, MA
Down Stream
Up Stream
Height (ft)
5
4
3
2
1
0
6/20/05
6/21/05
6/22/05
6/23/05
6/24/05
6/25/05
6/26/05
Date

Great Marsh Coastal Wetlands Restoration Planning
Rapid Field Assessment

Site # 353
Old County Road

Site Information

Site ID:	353
Site Name:	Old County Road
Municipality	Salisbury
Location:	Southern side of Old County Road, 0.5 mi west of Salisbury Beach
Adjacent Waterbody:	Blackwater River

Affected Area (Acres)

Mudflat/Open Water:	0	Total Area:	6.5
Salt Marsh:	1.9		
Other Wetland:	4.7	*Other Description:*	
Other:	0		

Impairment(s)

Tidal Restriction	☑	Fill	☑
Obstructed Ditche(s)	☑	Invasive Species	☑
Impoundment	☐	Pollution / Siltation	☐

Severity of Impairments: Severe

Project Type

Roadway Culvert(s)	☑	Obstructed Ditches	☑
Bridge	☐	Fill	☐
Berm	☐	Other	

Evidence of Restriction

Gauge Data	☑	Impounded Flow	☐
Downstream Scour Pool	☐	Obstructed Flow	☑
Upstream Scour Pool	☐	Invasive Species	☑
Bank Erosion	☐	Ponded Conditions	☐
Slumping	☐	Subsidence	☑

Structure / Channel:

Overall Condition:	Fair
Life Expectancy (Years):	10
Road Condition:	Poor
Structure Type:	CMP culverts
Structure Age (Years)	40
Structure 1 Width (Feet):	1
Structure 1 Length (Feet):	44
Structure 2 Width (Feet):	1
Structure 2 Length (Feet):	38
Skew (Degrees):	0
Cover (Feet):	3.5
Scour Protectection:	☐
Adequately Aligned:	☑
Headwall Type:	None
Headwalll Condition:	None

Ecological Integrity / Habitat Value

Surrounding Land Use %

Commercial / Industrial	40
Residential	35
Agricultural	0
Undeveloped	25

Severity of Impairment(s)	Moderate
Invasive Plant Cover:	High
Extent of Wooded Buffer:	Poor
Habitat Connectivity:	Fair
NHESP Estimated Habitats of Rare Wildlife:	☐
NHESP Priority Habitats of Rare Species:	☐
NHESP BioMap Core Habitat:	☐
NHESP BioMap Supporting Natural Landscape:	☑
ACEC:	☐
Anadromous Fish:	☐
Shellfishing Suitability:	☑
Barriers to Fish Passage	Moderate

Great Marsh Coastal Wetlands Restoration Planning
Rapid Field Assessment

Site # 353
Old County Road

Construction Logistics / Feasibility

Traffic Volume	Low
Detour Potential	☑
Site Access	Good
Staging Areas	☑
Fill Material Concern	Minimal
Low Lying Property Concerns	Minimal
Overhead Utility Constraint	None

Underground Utilities

Water	☑	*Telephone*	☐
Gas	☑	*Sewer*	☐
Electric	☐	*Drainage*	☐

Permitting Complexity	Medium
Local Support	Yes
Feasibility Cost	20,000
Design Cost	30,000
Permitting Cost	25,000
Construction Cost	375,000
Total Cost	450,000
Relative Cost/Acre	69,000

Socioeconomic

Recreation

Public Access:	☐
Watercraft / Portage:	☐
Wildlife Viewing:	☑

Education

Schools Nearby:	☐
Ongoing Research:	☑
Education / Outreach Potential:	Medium
Saftey Concerns (Access):	Low

Uniqueness / Heritage Value

Rare Species Habitat:	☐
ACEC:	☐
Cultural Resource Features	☐
Urban Viewscape Value:	None
Urban Habitat Value:	None

Tide Surveys

	Start:		*Finish:*
Dates of 1st Survey:	5/26/2004	-	6/8/2004
Date of Highest Tide:	6/3/2004		
Max Measured Tidal Dampening:	0.67		
Percent of Tidal Prism:	33		
Measured Delay:	21 min		

	Start:		*Finish:*
Dates of 2nd Survey:	5/18/2005	-	6/2/2005
Date of Highest Tide:	6/24/2005		
Max Measured Tidal Dampening:	0.17		
Percent of Tidal Prism:	18		
Measured Delay:	23 min		

Summary

Uniqueness / Heritage Value:	Low	Ecological Integrity:	Low
Recreational Value:	Low	Logistics / Feasibility:	High
Educational Value:	Medium		

Restoration Potential: Moderate